

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2001-347369

(43)Date of publication of application : 18.12.2001

(51)Int.Cl.

B23K 3/02

B23K 3/03

B23K 31/02

H05K 3/34

(21)Application number : 2000-169613

(71)Applicant : TAIYO DENKI SANGYO KK

(22)Date of filing : 06.06.2000

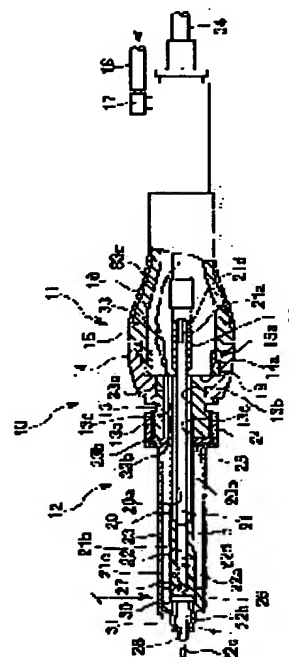
(72)Inventor : SAITO TAKAMI

## (54) SOLDERING IRON

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To perform satisfactory soldering by always spouting out uniformly an inert gas around a tip part and rendering a soldering portion oxygen-free, and to facilitate assembling, disassembling, maintenance and check.

**SOLUTION:** A spacer 20 is fixed to the holder part 13 of a soldering iron main body 11 and on the tip side of a heater 21 inserted through the spacer 20, a soldering iron tip 22 is fixed. On the outside of the soldering iron tip 22 and the spacer 20, a protective cover 23 is provided leaving an annular gap e, and a spacer ring 26 fits with the tip part of the protective cover 23 and the barrel part 22a of the soldering iron tip 22. A ventilation groove (gas path) 30 is provided on the spacer ring 26, which makes the tapered hole 28 of the spacer ring communicate with the annular gap e. When performing soldering working, the inert gas induced into the inside of the soldering iron main body 11, is spouted out around the tip 22c of the tip of the soldering iron 22 through the annular gap e, the ventilation groove 30 and an annular space f.



## LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's  
decision of rejection]

[Date of extinction of right]

Copyright (C); 1998,2003 Japan Patent Office

**\* NOTICES \***

Japan Patent Office is not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

**CLAIMS**

---

**[Claim(s)]**

[Claim 1] In the soldering iron constituted so that it might have the following and inert gas might be made to blow off through the aforementioned annular gap to the circumference by the side of the nose of cam of an above trowel place at an above trowel place The soldering iron which SU \*\*--SARINGU which fits into this trowel point and a protective cover, and holds those cardiac states of these is prepared, and is characterized by forming the gas passageway which leads inert gas to this spacer ring from the aforementioned annular gap at the circumference by the side of the nose of cam of an above trowel place. The main part of a trowel The heater supported on this main part of a trowel The trowel point connected with the point of this heater The tubed protective cover which opened the annular gap, was prepared in the periphery side of this trowel point, and attached the end face section in the aforementioned main part of a trowel [Claim 2] The aforementioned heater and an above trowel place are a soldering iron according to claim 1 characterized by being formed as a thing of one.

[Claim 3] While the major-diameter axial hole to which it has the following, the aforementioned spacer ring fits into the fuselage section of an above trowel place at a end face side, and a pars basilaris ossis occipitalis contacts the apical surface is prepared The minor diameter axial hole which forms annular space between the peripheries of the aforementioned chip section is prepared in a nose-of-cam side. It consists of tubed part material which closes the nose-of-cam side of the aforementioned annular gap after the nose-of-cam side of the aforementioned chip section has projected from this minor diameter axial hole. the aforementioned gas passageway The soldering iron according to claim 1 or 2 which is formed towards the diameter direction of a spacer ring and is characterized by the bird clapper from the aeration slot which connects the aforementioned annular gap and the aforementioned minor diameter axial hole to the pars-basilaris-ossis-occipitalis side of the major-diameter axial hole of this spacer ring, or a vent hole. An above trowel place is the fuselage section connected with the point of the aforementioned heater. The chip section of the shape of a taper shaft by which it was combined at the nose of cam of this fuselage section, and the major-diameter section by the side of the fuselage section was formed in the minor diameter from this fuselage section

[Claim 4] It is the soldering iron according to claim 1 to 3 which is supported by tubular SU \*\*--SA which inserted the aforementioned heater in the axial hole of the electrode-holder section fixed at the nose of cam of the aforementioned main part of a trowel, and was fixed, and is characterized by for the aforementioned protective cover engaging with the nut which the end face section screwed in the aforementioned electrode-holder section while the point engaged with the periphery apical surface of the aforementioned spacer ring, and fixing it to this electrode-holder section.

[Claim 5] The aforementioned spacer is a soldering iron according to claim 4 characterized by leading the inert gas which two or more air holes penetrated to this axial hole are prepared in the circumference, and is supplied in the aforementioned main part of a trowel to the annular gap of the aforementioned protectiv cover and the trowel point through the crevice and the aforementioned air hole between the aforementioned spacer and a heater while the axial hol is formed in a major diameter from the diameter of the aforementioned heater.

[Claim 6] The aforementioned spacer is a soldering iron according to claim 4 or 5 characterized by consisting of a conductiv member and connecting the ground.

[Claim 7] The soldering iron according to claim 1 to 6 characterized by connecting a thermo sensor to the exoergic section by the side of the nose of cam, and the lead wire of this thermo sensor being drawn from the end face side of a heater by the aforementioned heater.

[Claim 8] The aforementioned main part of a trowel is a soldering iron according to claim 4 to 7 characterized by having the head section which fixed the aforementioned electrode-holder section, and the grip section connected with the back end section of this head section airtightly and free [ attachment and detachment ].

[Claim 9] The soldering iron according to claim 7 or 8 characterized by drawing the wiring tube which gathered the power supply line linked to the aforementioned ground, or the lead wire and the aforementioned heater of a thermo sensor while the gas introduction joint which supplies inert gas is formed in the main part of a trowel at the back end section side of the aforementioned main part of a trowel.

---

[Translation done.]

\* NOTICES \*

Japan Patent Office is not responsible for any damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.\*\*\*\* shows the word which can not be translated.

3.In the drawings, any words are not translated.

---

DETAILED DESCRIPTION

---

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the soldering iron which was made to solder in inert gas atmosphere.

[0002]

[Description of the Prior Art] As shown in drawing 7, as this kind of a soldering iron conventionally The main part 1 of a trowel, The heater 3 supported in the electrode-holder section 2 fixed to this main part 1 of a trowel, and the trowel point 5 which is connected with the point of this heater 3 and has chip section 4b at the nose of cam of fuselage section 4a, The annular gap a is opened, and it is prepared in the periphery side of this trowel point 5, and has the tubed protective cover 6 which attached end face section 6a in the aforementioned electrode-holder section 2. in the case of soldering work The nitrogen gas introduced into the interior b of the main part 1 of a trowel is poured in the aforementioned annular gap a through air hole 2a of the electrode-holder section 2. The circumference of chip section 4a is made to blow off by the nose-of-cam side of the aforementioned protective cover 6, a soldering part is changed into an anoxia state, and the soldering iron which the aforementioned chip section 4a is contacted to a soldering part, and was made to solder with flux loess solder is known (re-official announcement patent WO 98/No. 30352 official report etc.).

[0003]

[Problem(s) to be Solved by the Invention] However, in the aforementioned conventional soldering iron, since the aforementioned heater 3, the trowel point 5, and the protective cover 6 are attached in the electrode-holder section 2 in the state of the cantilever, while using it for a long period of time, the contact pressure to the soldering part of chip section 4a etc. serves as force to which the variation rate of the attachment section of the aforementioned heater 3 and the electrode-holder section 2 is carried out, and acts, and, thereby, this attachment section loosens gradually. For this reason, the concentricity of the aforementioned heater 3 and the trowel point 5, and a protective cover 6 collapses. The annular gap a b between the aforementioned protective cover 6 and the trowel point 5, i.e., the annular space between the nose of cam of a protective cover 6 and chip section 4a, does not become a hoop direction in an equal annular gap. Therefore, by the distribution state of the nitrogen gas spouted around chip section 4a not becoming equal, but inclining partially from the nose of cam of a protective cover 6, etc. The whole soldering part could not be made into the atmosphere of the anoxia state fully filled with nitrogen gas, but there was a trouble that soldering good as a result could not be performed.

[0004] this invention is made in view of the above-mentioned situation, makes the inert gas of equal thickness blow off around the chip section of the trowel point, without spoiling the concentricity of the trowel point and a protective cover, even if it uses it for a long period of time, and aims at offering the soldering iron which changes a soldering part into an anoxia state certainly, and can perform always good soldering. Moreover, other purposes of this invention are to offer the easy soldering iron of assembly, decomposition and maintenance, and check.

[0005]

[Means for Solving the Problem] this invention is characterized by the following points, in order to solve the aforementioned technical problem. Namely, the heater which supported the soldering iron concerning a claim 1 on the main part of a trowel, and this main part of a trowel, Connect with the point of this heater, and open an annular gap and it is prepared in the periphery side of the trowel point and this trowel point. In the soldering iron constituted so that it might have the tubed protective cover which attached the end face section in the aforementioned main part of a trowel and inert gas might be made to blow off through the aforementioned annular gap to the circumference by the side of the nose of cam of an above trowel place SU \*\*--SARINGU which fits into this trowel point and a protective cover, and holds those cardiac states of these is prepared in an above trowel place, and it is characterized by forming the gas passageway which leads inert gas to this spacer ring from the aforementioned annular gap at the circumference by the side of the nose of cam of an above trowel place.

[0006] While energizing from a power supply line at a heater and making this heater generate heat in the above-mentioned soldering iron in the case of soldering Supplying inert gas, such as nitrogen gas, to the aforementioned annular gap from the back end section of the main part of a trowel etc. It solders by contacting the chip section to the soldering part of a jointing article and a jointing-ed article, operating the main part of a trowel, moving the trowel point heated at the heater to a soldering part, and carrying out melting of the solder in the chip section at the nose of cam. In this case, it is led to the circumference of the aforementioned chip section through the gas passageway of the aforementioned spacer ring, and the inert gas supplied to the aforementioned annular gap is \*\*\*\*. It can solder in the atmosphere in which the circumference of the aforementioned soldering part is covered by inert gas, and oxygen does not exist by this.

[0007] According to this soldering iron, it can solder, inert gas being equally distributed over the circumference of the chip section at the nose of cam of the trowel point, and always maintaining a soldering part in a good atmosphere of an anoxia state, since the above trowel place and the protective cover are always held by the aforementioned spacer ring at this heart. Even if the attachment section to the main part of a trowel of the trowel point and a protective cover may loosen using a soldering iron for a long period of time, the atmosphere of the anoxia state always stabilized since this cardiac state of an above trowel place and a protective cover did not change is maintained, and it is good soldering \*\*\*\*\*. Moreover, oxidization of the chip section is prevented and maintenances, such as check and repair, are also easy.

[0008] The soldering iron concerning a claim 2 is characterized by forming a heater and the trowel point as a thing of one in a soldering iron according to claim 1. In this soldering iron, the number of attachment parts can be reduced and manufacture, assembly, and maintenance can be performed easily.

[0009] The soldering iron concerning a claim 3 is set to a soldering iron according to claim 1 or 2. the trowel point It consists of the fuselage section connected with the point of a heater, and the chip section of the shape of a taper shaft by which it was combined at the nose of cam of this fuselage section, and the major-diameter section by the side of the fuselage section was formed in the minor diameter from this fuselage section. a spacer ring While the major-diameter axial hole to which it fits into the fuselage section of an above trowel place, and a pars basilaris ossis occipitalis contacts a end face side at the apical surface is prepared The minor diameter axial hole which forms annular space between the peripheries of the aforementioned chip section is prepared in a nose-of-cam side. It consists of tubed part material which closes the nose-of-cam side of the aforementioned annular gap after the nose-of-cam side of the aforementioned chip section has projected from this minor diameter axial hole. a gas passageway It is formed towards the diameter direction of a spacer ring, and is characterized by the bird clapper from the aeration slot which connects the aforementioned annular gap and the aforementioned minor diameter axial hole to the pars-basilaris-ossis-occipitalis side of the major-diameter axial hole of this spacer ring, or a vent hole. In this soldering iron, while this cardiac state of the trowel point and a protective cover is certainly held by the spacer ring by which positioning support was carried out at an above trowel place, the inert gas introduced into the aforementioned annular gap is exactly led to the circumference of the chip section of an above trowel place, and the atmosphere of much more good soldering is formed.

[0010] The soldering iron concerning a claim 4 is set to a sold ring iron according to claim 1 to 3. a heater It is supported by tubular SU \*\*-SA inserted in and fixed to the axial hole of the electrode-holder section fixed at the nose of cam of th main part of a trowel. a prot ctive cover While a point engages with the periphery apical surface of a spacer ring, it is characterized by for the end face section engaging with the nut screwed in the aforementioned electrode-holder section, and fixing it to this el ctrode-holder section. In this soldering iron, since the trowel point and the protective cover which were held at this heart are supported in one through a spacer by binding the aforementioned nut tight by the main part of a trowel by the aforementioned spacer ring, even if the force acts on the chip section with soldering work, the aforementioned support is ensured and it is stabilized, and the unnecessary force does not act on a heater and it does not produce un-arranging [ that this heater is damaged ].

[0011] It is characterized by leading the inert gas which two or more air holes around penetrated at this axial hole while, as for the soldering iron concerning a claim 5, the axial hole is formed in a major diameter from the diameter of a heater in a soldering iron according to claim 4, as for a spacer are prepared, and is supplied in the main part of a trowel to an annular gap with the protective cover and trowel point through the crevice between the aforementioned spacer and a heater, and the aforementioned air hole. In this soldering iron, while the inert gas supplied in th main part of a trowel is smoothly led to the outside of the trowel point through the crevice between the aforementioned heater and a spacer, inert gas is certainly heated at a heater and blows off around the chip section of the trowel point.

[0012] In a soldering iron according to claim 4 or 5, a spacer consists of a conductive member and the soldering iron concerning a claim 6 is characterized by connecting the ground. In this soldering iron, since the current revealed to the trowel point is certainly missed by the grounding section of a soldering iron through the aforementioned ground from a heater, electric security of a soldering iron in use is maintained.

[0013] In a soldering iron according to claim 1 to 6, a thermo sensor is connected to a heater at the exoergic section by the side of the nose of cam, and the soldering iron concerning a claim 7 is characterized by drawing the lead wire of this thermo sensor from the end face side of a heater. In this soldering iron, the heating temperature of the trowel point at a heater is detected easily, and it can use for the temperature control. Since the lead wire of a thermo sensor is drawn from the end face section of a heater, wiring of trowel circles becomes unnecessary and lead wire can be processed easily.

[0014] The soldering iron concerning a claim 8 is characterized by equipping the main part of a trowel with the head section which fixed the electrode-holder section, and the grip section connected with the back end section of this head section airtightly and free [ attachment and detachment ] in a soldering iron according to claim 4 to 7. In this soldering iron, since the main part of a trowel can separate into the head section and the grip section, connection of wiring in the assembly of each component part of a soldering iron, decomposition, and a soldering iron etc. becomes easy, and maintenance and check can be performed easily.

[0015] In a soldering iron according to claim 7 or 8, the soldering iron concerning a claim 9 is characterized by drawing the wiring tube which gathered the power supply line linked to the ground, or the lead wire and the heater of a thermo sensor while the gas introduction joint which supplies inert gas to the back end section side of the main part of a trowel in the main part of a trowel is formed. In this soldering iron, since it is not necessary to arrange a gas introduction tube, a wiring tube, etc. which become obstructive to soldering work at the trowel drawer back of a soldering iron, soldering work can carry out well smoothly.

[0016]

[Embodiments of the Invention] Hereafter, the gestalt of 1 operation of this invention is explained based on drawing 1 - drawing 3 . In drawing 1 - drawing 3 , 10 is the soldering iron equipped with the main part 11 of a trowel, and the trowel section 12 attached at the nose of cam of this main part 11 of a trowel. The main part 11 of a trowel consists of the tubed grip section 15 connected with the aforementioned head section 14 free [ attachment and detachment ] through male screw 15a screwed in female screw 14a of the bayonet formula formed in the back end of the head section 14 which consists of insulating material, such as

synthetic resin which fixed the electrode-holder section 13 at the nose of cam, and this head section 14. This grip section 15 also consists of the same material as the head section 14, and covering 16 for the skids which consist of rubber, synthetic resin, etc. is given to the periphery of the first portion. Moreover, the gas introduction joint 17 is being fixed to the flank by the side of the back end of the grip section 15, and in rt gas, such as nitrogen gas supplied from the gas introduction tube 18, is introduced into the interior of the grip section 15. In addition, it is equipped with the packing 19 made of rubber inside the connection section of the aforementioned head section 14 and the grip section 15, and the airtight of this connection section is held.

[0017] It \*\*\*\*s on the periphery by the side of a nose of cam ( drawing 1 left end side), 13a is prepared, axial hole 13b is formed in the interior, the spacer 20 of the shape of a cylinder which consists of conductive material, such as stainless steel, fits the end face section (it is the right end section at drawing 1 ) into major-diameter section 13c ahead of this axial hole 13b, and the aforementioned electrode-holder section 13 is being fixed to it. The heater 21 of the shape of the round bar with an outer diameter smaller than the bore of this axial hole 20a is projected and inserted in axial hole 20a of this spacer 20 forward and backward.

[0018] This heater 21 consists of a ceramic heater etc., the trowel point 22 is connected with the point ahead projected from the spacer 20, and power supply line 21a is connected to the end face section projected behind the spacer 20. Thermo-sensor 21c which detects the exoergic temperature by exoergic section 21b by the side of the point of this heater 21 is connected to the point of 21 of a heater, and 21d of the lead wire is drawn from the end face section of a heater 21. Moreover, two or more air hole 20b penetrated to axial hole 20a opens an interval in a hoop direction suitably, and is prepared in the circumference of the aforementioned spacer 20.

[0019] The above trowel place 22 consists of a metallic material with large thermal conductivity. Cylinder-like fuselage section 22a, It is connected at the nose of cam (it is a left end at drawing 1 ) of this fuselage section 22a at one, and has chip section 22b of the shape of a taper shaft by which the major-diameter section was formed in the minor diameter from the diameter of fuselage section 22a. Nose-of-cam chip 22c which carries out heating fusion of the solder while contacting a soldering part at the nose of cam of this chip section 22b is combined. Fuselage section 22a fits into the point side of the aforementioned heater 21 in 22d of axial holes of the inside, and is combined with this heater 21, and the end face section (it is the right end section at drawing 1 ) of fuselage section 22a is contacted at the nose of cam of the aforementioned spacer 20.

[0020] Moreover, the cylinder-like protective cover 23 is formed in the periphery side of the aforementioned spacer 20 and the above trowel place 22 so that the annular gap e may be opened among them and they may be covered. Flange 23a by the side of the end face is contacted by the apical surface of the aforementioned electrode-holder section 13, and this protective cover 23 is supported at the nose of cam of the aforementioned electrode-holder section 13 by bolting of flange 23a with the nut 24 screwed in the aforementioned screw-thread 13a. It is equipped with the packing 25 which has the insulation which consists of rubber holding the airtight of those connections etc. between flange 23a of a protective cover 23, and the apical surface of the electrode-holder section 13.

[0021] Furthermore, the spacer ring 26 which consists of stainless steel etc. is supported at the nose-of-cam side of fuselage section 22a of the trowel point 22. Annular flange 26a by which this spacer ring 26 formed the major-diameter axial hole 27 in the end face side (drawing 1 right end side) as shown in drawing 2 and drawing 3 , It is combined with the nose-of-cam side of this flange 26a, and consists of a cylinder-like member (tubed part material) which has taper-like ring 26b which formed the tapered bore (minor diameter axial hole) 28 which forms the necessary annular space f inside between the peripheries of chip section 22b of the above trowel place 22. It fits into the point of fuselage section 22a of the above trowel place 22 through the major-diameter axial hole 27 of the aforementioned flange 26a, and it is constituted so that the pars basilaris ossis occipitalis 29 of this major-diameter axial hole 27 may be contacted by the apical surface of the aforementioned fuselage section 22a and positioning of shaft orientations may be made.



[0022] And the aeration slot (gas passageway) 30 deeper than this pars basilaris ossis occipitalis 29 opens an interval in the hoop direction of a spacer ring 26 suitably, and is formed in the diameter direction at the pars basilaris ossis occipitalis 29 of a spacer ring 26 so that it may be open for free passage to the tapered bore 28 of the aforementioned taper-like ring 26b. [ two or more ] The aforementioned taper-like ring 26b constitutes the nozzle which spouts the inert gas of a shell around nose-of-cam chip 22c from an aforementioned annular gap e. As for the aforementioned protective cover 23, the nose-of-cam side (drawing 1 left end side) is attached outside the periphery of the aforementioned spacer ring 26. If the inside of the flange 31 towards inside the point is contacted by the apical surface 32 of the periphery section of a spacer ring 26 and binds the aforementioned nut 24 tight. A spacer ring 26 is pressed back (it is the right at drawing 1 ) by the flange 31, and it is constituted so that the above trowel place 22 and a spacer 20, and a protective cover 23 may keep the mutual annular gap e constant and may be combined with the aforementioned electrode-holder section 13 in one.

[0023] In addition, the ground 33 which misses the current revealed from a heater 21 is built in the grip section 15, and this ground 33 is equipped with lead-wire 33a which had the inside of 13d of shaft-orientations slots formed in axial hole 13b of the electrode-holder section 13 let it pass, and is connected to the aforementioned spacer 20 by the edge 33b. And lead-wire 33c of a ground 33 is summarized together with 21d of lead wire of power supply line 21a or the aforementioned thermo-sensor 21c attached in the aforementioned heater 21, is held in the interior of the insulating tube (wiring tube) 34 connected to the end face section of the aforementioned heater 21, and is drawn from the back end section (it is the right end section at drawing 1 ) of the grip section 15 of the main part 11 of a trowel. Edge 33b of the aforementioned lead-wire 33a is covered and protected by the aforementioned packing 25.

[0024] When doing soldering work in the soldering iron constituted as mentioned above, while energizing at a heater 21 through power supply line 21a and heating nose-of-cam chip 22c of the trowel point 22 first, inert gas, such as nitrogen gas, is introduced in the grip section 15 through the gas introduction joint 17 from the gas introduction tube 18. The inert gas introduced in the grip section 15 enters in the electrode-holder section 13. the gap of a spacer 20 and a heater 21. A passage, it goes into the annular clearance e inside a protective cover 23 through air hole 20b of a spacer 20, being certainly heated at a heater 21. Furthermore, the annular space f between a tapered bore 28 and chip section 22b of the trowel point 22 is reached through the aeration slot 30 of the aforementioned spacer ring 26, and it blows off around nose-of-cam chip 22c.

[0025] Next, operate a soldering iron 10 and the trowel point 22 is brought close to a soldering part. Making inert gas blow off to a soldering part, after preheating a soldering part by the inert gas which a heater 21 preheats as mentioned above and is spouted from the tapered bore 28 of a spacer ring 26. Nose-of-cam chip 22c is contacted to a soldering part, this part is heated further, and melting solder is dished up to a soldering part in the atmosphere which supplied flux, loess solder or lead loess solder, and changed into the anoxia state by jet of the inert gas which it preheated. The temperature of nose-of-cam chip 22c under soldering work is detected by the temperature sensor 33 at the nose of cam of a heater 21, and is suitably controlled by the control unit according to a soldering situation. During soldering work, when current is revealed from a heater 21, current should be missed through the aforementioned ground 33 to the grounding section, and safety should be held certainly.

[0026] It can solder inert gas being equally distributed over the circumference of nose-of-cam chip 22c of the trowel point 22, and maintaining a soldering part in the atmosphere of an anoxia state, since according to the aforementioned soldering iron 10 positioning support of the aforementioned spacer ring 26 is carried out at the trowel point 22 and the trowel point 22 and the protective cover 23 are held by this spacer ring 26 at this heart. Even if it may use a soldering iron for a long period of time and the attachment section to the main part 11 of a trowel of the trowel section 12 may loosen, since this cardiac state of the above trowel place 22 and a protective cover 23 does not change by operation of a spacer ring, it always maintains the atmosphere of the stable anoxia state, and soldering of the quality of an excellent article can do it. And since nose-of-cam chip 22c is in a perfect nonoxidizing atmosphere during soldering

work, oxidization is prevented and it can perform easily maintenance -- when the wettability of melting solder is good and can exclude cleaning of a nose-of-cam chip, the life of a nose-of-cam chip can be improved -- and check.

[0027] Moreover, since the trowel point 22 and the protective cover 23 which were held at this heart are supported in one through the spacer 20 by binding the aforementioned nut 24 tight in the electrode-holder section 13 by the main part 11 of a trowel by the aforementioned spacer ring 26. Even if the force acts on nose-of-cam chip 22c with soldering work, there is no possibility that the aforementioned supporter may loosen and the stable above-mentioned support is gained certainly, and the unnecessary force does not act on a heater 21 and it does not produce un-arranging [ that this heater 21 is damaged ].

[0028] Moreover, since the main part 11 of a trowel can separate into the head section 14 and the grip section 15, when there are an open circuit of the faulty connection to the spacer 20 of the lead wire 33 of a ground 33 and the lead wire 33c and 21d of a ground 33 or thermo-sensor 21c, an open circuit of power supply line 21a of a heater 21, etc., those situations are checked from the above-mentioned separation section, and repair of a poor part, exchange of parts, etc. are performed. Moreover, since the insulating tube 34 which gathered power supply line 21a linked to the ground 33, or the lead wire 33c and 21d and the heater 21 of thermo-sensor 21c is drawn while the gas introduction joint 17 which supplies inert gas to the back end section side of the main part 11 of a trowel is formed and there is nothing that becomes obstructive to soldering work in the trowel point 22 side of a soldering iron 10, soldering work can carry out well smoothly.

[0029] In addition, in the gestalt of the aforementioned implementation, although considered as the composition which forms two or more aeration slots 30 which connect the annular gap e inside a protective cover 23, and the annular space f inside a spacer ring 26 to the pars basilaris ossis occipitalis 29 of the major-diameter axial hole 27 of the spacer ring 26 which fits into the point of fuselage section 22a of the trowel point 22 in the diameter direction of a spacer ring 26, it can replace with this, and as shown in drawing 4, it can also constitute. That is, the spacer ring 35 which prepared two or more air hole 35a which the interval was suitably opened in the hoop direction, and it has been arranged, and was penetrated towards shaft orientations is made to fit into the point of fuselage section 22a of the above trowel place 22 through the axial hole 35b, and inside flange 35c of axial hole 35b is made to contact the apical surface of fuselage section 22a. On the other hand, the nose-of-cam side of the protective cover 36 attached outside a spacer ring 35 is considered as the composition which prepared taper-like cylinder part 36b which the front reduces the diameter gradually towards nose-of-cam chip 22c, and forms the annular space g between chip section 22b of the trowel point 22 from this step 36a while it prepares step 36a which contacts the apical surface of the aforementioned spacer ring 35. The aforementioned taper-like cylinder part 36b achieves the duty of the nozzle which spouts inert gas around nose-of-cam chip 22c. Thus, if constituted, the structure of a spacer ring 35 will become easy and manufacture will become easy.

[0030] Furthermore, a spacer ring 26 can also be constituted in the spacer ring 37 as replaced with this and shown in drawing 5 and drawing 6. Major-diameter boss 37b by the side of the end face which fits into the cylinder-like member (tubed part material) by which this spacer ring 37 formed taper 37a in the periphery of a point at fuselage section 22a of the trowel point 22, While preparing minor diameter boss 37c by the side of the nose of cam which forms the annular space h between the peripheries of chip section 22b 37d (gas passageway) of two or more air holes penetrated from the periphery of the aforementioned cylinder-like member in the diameter direction towards minor diameter boss 37c to the pars-basilaris-ossis-occipitalis side of the aforementioned major-diameter boss 37b opens an interval in a hoop direction suitably, and they are formed in it.

[0031] The nose-of-cam side of a protective cover 38 is formed as taper tubed part 38a which engages with taper 37a of a spacer ring 37. In this case, between the inner circumference of the aforementioned protective cover 38, and the periphery of a spacer ring 37 The gap connected to the annular gap e between the above trowel place 22 and a protective cover 38 is formed. The duty of the nozzle to which the annular gap and the aforementioned minor diameter boss 37c

are connected through the 37d of the aforementioned air holes, and a spacer ring 37 spouts the inert gas from the annular gap e around nose-of-cam chip 22c is achieved. And if flange 38b by the side of the end face of a protective cover 38 can draw near to the electrode-holder section 13 side with the nut 24 screwed in the electrode-holder section 13, an alignment operation will arise through engagement to taper 37a of the aforementioned spacer ring 37, and taper tubed part 38a of a protective cover 38, and the trowel point 22 and a protective cover 38 will be held at this cardiac state.

[0032] In addition, in the soldering iron of the form of each aforementioned implementation, since it has many parts which are common in the usual soldering iron which does not inject inert gas in the chip section of the trowel point, it can constitute easily in the soldering iron of an inert gas injection formula by adding slight reconstruction for this usual soldering iron to this, and equipping with the aforementioned spacer rings 22, 26, and 37, protective covers 23, 36, and 38, and gas introduction joint 17 grade.

[0033]

[Effect of the Invention] As explained above, according to this invention, the effect which was excellent in the following is done so. Although the attachment section to the main part of a trowel of the trowel point or a protective cover loosens while using the soldering iron for a long period of time according to the soldering iron concerning a claim 1 Since it can always hold uniformly, without this cardiac state of an above trowel place and a protective cover changing by existence of a spacer ring Inert gas can be equally distributed over the circumference of the chip section of the trowel point, a soldering part can always be maintained in the atmosphere of an anoxia state, and it can solder good with flux loess solder or lead loess solder. For this reason, the life by antioxidizing of the chip section of the trowel point of a soldering iron can be improved, and the maintenance concerning maintenance, check, etc. can be performed easily.

[0034] According to the soldering iron concerning a claim 2, the number of attachment parts can be reduced and manufacture, assembly, and maintenance can be performed easily. According to the soldering iron concerning a claim 3, while being able to hold certainly this cardiac state of the trowel point and a protective cover, the inert gas introduced into the annular gap between an above trowel place and a protective cover can be exactly led to the circumference of the chip section of an above trowel place, and the atmosphere of much more good soldering can be formed.

[0035] Since the trowel point and the protective cover which were held at this heart can be supported on the main part of a trowel in one through a spacer by binding a nut tight by the spacer ring according to the soldering iron concerning a claim 4 Even if the force acts on the chip section with soldering work, it can be stabilized certainly and the aforementioned support can be performed, and it can prevent un-arranging [ that the unnecessary force acts on a heater and this heater is damaged ].

[0036] While being able to lead smoothly the inert gas supplied in the main part of a trowel to a trowel point side through the crevice between a heater and a spacer according to the soldering iron concerning a claim 5, the inert gas which heated inert gas certainly at the heater and preheated around the chip section can be made to blow off.

[0037] Since the current revealed to the trowel point can be certainly missed in the grounding section of a soldering iron through a ground from a heater according to the soldering iron concerning a claim 6, electric security of a soldering iron in use can be kept certain. Since the lead wire of a thermo sensor is drawn from the end face section of a heater while according to the soldering iron concerning a claim 7 being able to detect the heating temperature of the trowel point at a heater easily and being able to use for the temperature control of a heater, wiring of trowel circles can become unnecessary and lead wire can be processed easily.

[0038] Since the main part of a trowel can separate into the head section and the grip section, while being able to make easily connection of wiring in the assembly of each component part of a soldering iron, decomposition, and a soldering iron etc. according to the soldering iron concerning a claim 8, maintenance, check, etc. can be performed easily. Since it is not necessary to arrange a gas introduction tube, a wiring tube, etc. which become obstructive to soldering work at the trowel drawer back of a soldering iron according to the soldering iron concerning a claim 9,

soldering work can be done smoothly and well.

---

[Translation done.]

## \* NOTICES \*

Japan Patent Office is not responsible for any damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.\*\*\*\* shows the word which can not be translated.

3.In the drawings, any words are not translated.

---

## DESCRIPTION OF DRAWINGS

---

### [Brief Description of the Drawings]

[Drawing 1] It is drawing of longitudinal section showing the gestalt of 1 operation of the soldering iron concerning this invention.

[Drawing 2] It is the enlarged view which cut and lacked a part of I view of drawing 1 .

[Drawing 3] It is the X-X cross section of drawing 2 .

[Drawing 4] It is drawing of longitudinal section showing the gestalt of other operations of the soldering iron concerning this invention.

[Drawing 5] It is drawing of longitudinal section of the soldering iron concerning this invention showing the gestalt of other operations further.

[Drawing 6] It is the Y-Y cross section of drawing 5 .

[Drawing 7] It is drawing of longitudinal section showing an example of the conventional soldering iron.

### [Description of Notations]

10 Soldering Iron 11 Main Part of Trowel

12 Trowel Section 13 Electrode-Holder Section

14 Head Section 15 Grip Section

17 Gas Introduction Joint 20 Spacer

21 Heater 21C Thermo Sensor

22 Trowel Point 22a Fuselage Section

22b Chip section 22c Nose-of-cam chip

23, 36, 38 Protective cover 26, 35, 37 Spacer ring

26a Flange 26b Taper-like ring

30 Aeration Slot (Gas Passageway) 33 Ground

34 Insulating Tube (Wiring Tube) 35a, 37D Air Hole (Gas Passageway)

e Annular gap f, g, h Annular space

---

[Translation done.]

## \* NOTICES \*

Japan Patent Office is not responsible for any damages caused by the use of this translation.

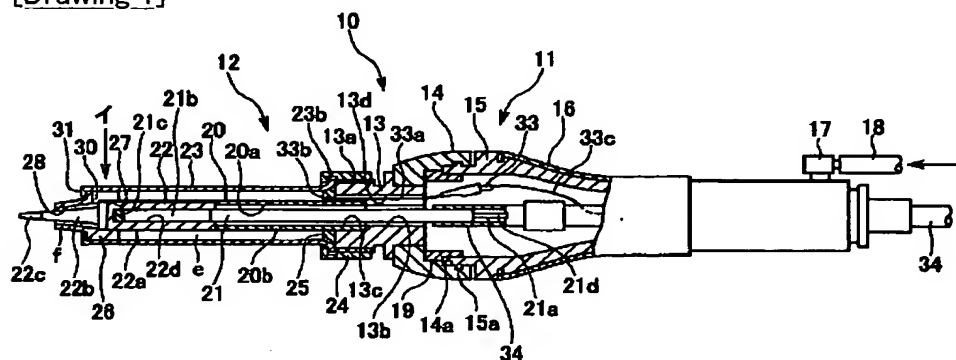
1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.\*\*\*\* shows the word which can not be translated.

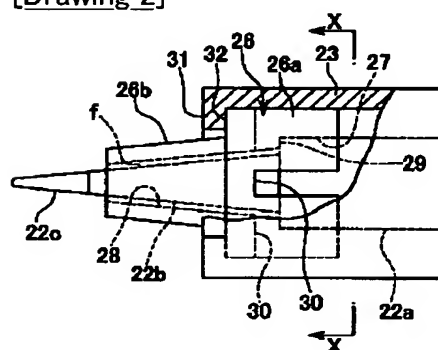
3.In the drawings, any words are not translated.

## DRAWINGS

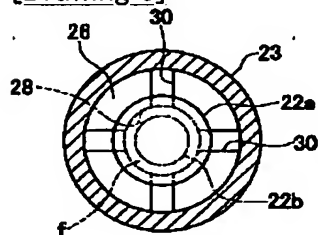
[Drawing 1]



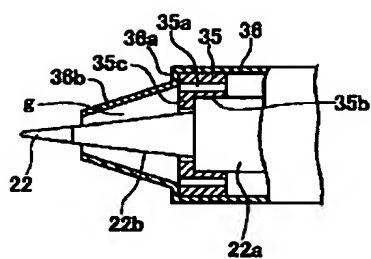
[Drawing 2]



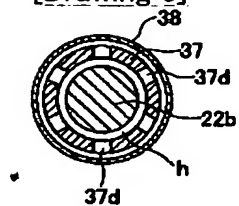
[Drawing 3]



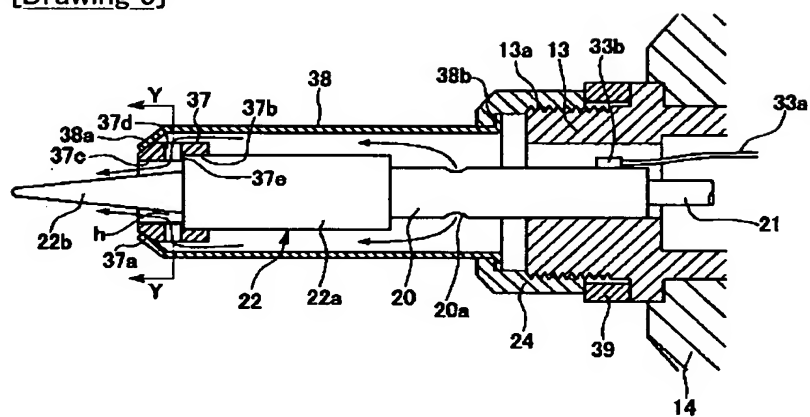
[Drawing 4]



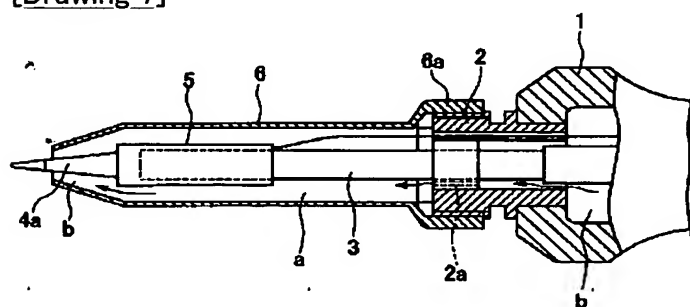
[Drawing 6]



- [Drawing 5]



[Drawing 7]



[Translation done.]